SURGEX®
energy intelligence

SEQ1200i

OPERATING MANUAL AND USER GUIDE

Electronic Systems Protection, Inc
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Knightdale NC 27545

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IMPORTANT SAFETY INSTRUCTIONS

CAUTION!
RISK OF ELECTRIC SHOCK
DO NOT OPEN

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

WARNING: CONNECT ONLY TO MAINS SOCKET WITH PROTECTIVE EARTHING CONNECTION.

The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CAUTION

1. **Please read and retain these safety instructions.**
2. **Heed all warnings in the operating instructions and on the appliance.**
3. **Do not use this appliance near water or moisture.**
4. **Clean only with a dry cloth.**
5. **Install in a good quality 19" equipment rack**
6. **Do not install near sources of heat such as radiators, heat registers, stoves or other apparatus that produce heat (such as amplifiers).**
7. **Refer all servicing to authorised personnel.**
8. **Servicing is required when the appliance has been damaged in any way including: Impact damage, power cord/ supply damage, liquid spillages, small objects falling into the unit or exposure to moisture. In addition please refer to authorised service personnel if the appliance is not operating normally.**
9. **To completely disconnect this equipment from the AC mains disconnect the power plug from the AC receptacle.**
10. **To prevent fire never place the appliance near any naked flame such as a candle.**
11. **This is a CLASS 1 device and shall be connected to a mains socket with a protective earth connection.**
12. **Do not defeat the purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is there for your safety. If the plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.**

Management of WEEE ((Waste Electrical and Electronic Equipment) Applicable in member states of the European Union and other European countries with individual nation policies on the management of WEEE) The symbol on the product or its packaging indicates that this product may not be treated as regular household waste. It should be returned to the retailer where the product was purchased or local collection systems should be used to ensure environmentally safe recycling.

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SEQ1200i

SEQUENCER SURGE ELIMINATOR & POWER CONDITIONER

Caution

The SEQ1200i series products permit a maximum 16A (SEQ1216i models), 15A (SEQ1215i models), 13A (SEQ1213i models) or 10A (SEQ1210i models) total output load with a maximum 10A load per outlet. Please check and make sure that each load connected to the unit does not exceed 10A. Also make sure that the total does not exceed your mains receptacles current limit.

For safety please plug your SurgeX® unit into a fused receptacle (T20AL 250v fuse recommended).

SEQ1200i Series Mode® Protection is Live-Neutral only, if the polarity indicator is illuminated when connected to the mains please replace the plug observing correct polarity.

Description

The SurgeX SEQ1200i is a 230V rack-mounted power sequencer incorporating SurgeX power conditioning and surge elimination. The single rack-space steel enclosure is designed to be installed in a 19 inch equipment rack. A total of 10 IEC receptacles are provided on the rear panel. Two are always on, with the remaining eight configured as four sequenced banks of two receptacles per bank. 4 models are available with load capable circuitry and connectivity that conform to AS3112, BS1363, BS546 and CEE7/7 standards.

The power switch, delay time adjustment, and status LED's are all on the front panel. The always-on receptacles will be powered up whenever the mains voltage is within normal limits, the sequenced receptacles will only be activated if the power switch is on and a signal is also being received at the remote control terminal block on the rear panel. Status LED's on the front panel show the status of each bank. Red is off and green is on. Flashing yellow LED's between the bank LED's indicate the unit is running a power up or power down sequence.

Multiple units can be cascaded to provide a scalable power control platform. A single sequencer can also control multiple SurgeX remote control products (Such as the RT or RTi) to provide additional banks and also add more load capacity. This is achieved by wiring units together using the remote control terminal blocks on the rear panel. Remote control can be accomplished by using either a contact closure or a DC voltage from 5V to 30V. Terminals are also provided for an external status LED.

Features

- SurgeX *Advanced Series Mode*® Surge Elimination
- SurgeX *Impedance Tolerant*® EMI/RFI Filtering
- SurgeX *COUVS*® Over/Under Voltage Shutdown
- Accurate, Front Panel Adjustable Time Delay
- DC Voltage And Contact Closure Remote Control Inputs
- Two Or More Units Can Be Cascaded
- Auxiliary Relay Output For Control Of Other SurgeX Products
- 12 Volt DC Output For External Status LED

Installation

The SurgeX SEQ1200i is designed to be installed in a standard 19 inch equipment rack and requires one unit (1-U) of rack space. Use four rack screws to secure the rack ears to the rack rails. Connect power to the unit by plugging the cord into a suitable 230V, earthed AC receptacle. The polarity light on the rear panel will illuminate if live and neutral are incorrectly connected. If the polarity light is illuminated reverse the power plug where appropriate or get an electrician to correct the wiring of the receptacle.

230 Volt Connections

The sequencer has a total of 10 receptacles: four sequenced banks of two, and two always on. Consult the table below for the load capabilities of each model. Plug the equipment into the receptacle banks as needed to turn on equipment in the required sequence. The Always On receptacles provide power as long as AC is supplied to the SEQ1200i. The SEQ1200i runs sequentially during power up and down, Bank A always powers up first and off last, Bank D always powers up last and off first.

Model	Maximum Load Per Outlet	Total Maximum Load
SEQ1210i	10	10
SEQ1213i	10	13
SEQ1215i	10	15
SEQ1216i	10	16

Remote Control Connections

Remote connections are wired to the green 7-pin plug-in terminal block on the rear of the unit next to the power cord. After you have made the connections to the terminal block, plug it into the connector on the rear of the unit. Never solder (tin) wires before inserting in a terminal block – the solder will cold-flow and you will eventually have loose connections!

Terminal Block Connectors

- Pin 1 – Contact Closure
- Pin 2 – Applied Voltage / Contact Closure
- Pin 3 – Common
- Pin 4 – 12V LED Output
- Pin 5 – Cascade
- Pin 6 – Aux Relay Contact
- Pin 7 – Aux Relay Contact

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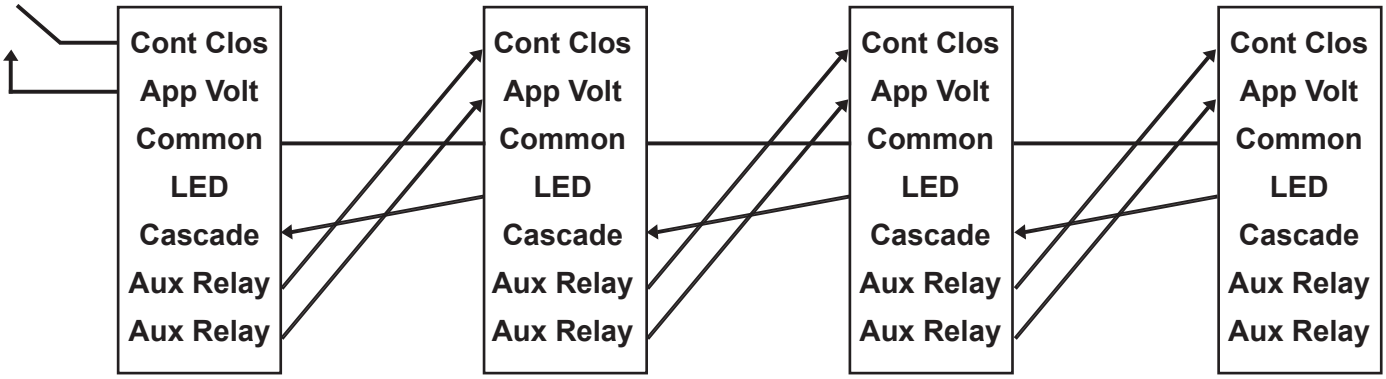
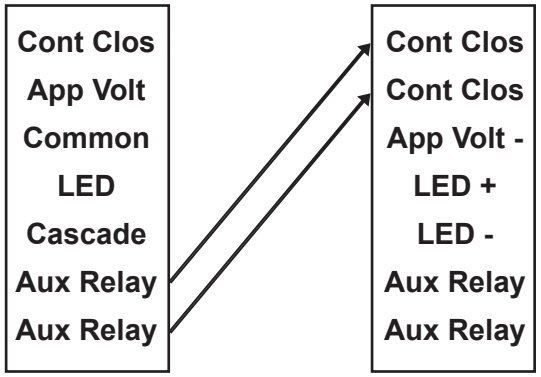
Connection Diagrams

Four Sequencers Cascaded Together



Sequencer controlling RT product



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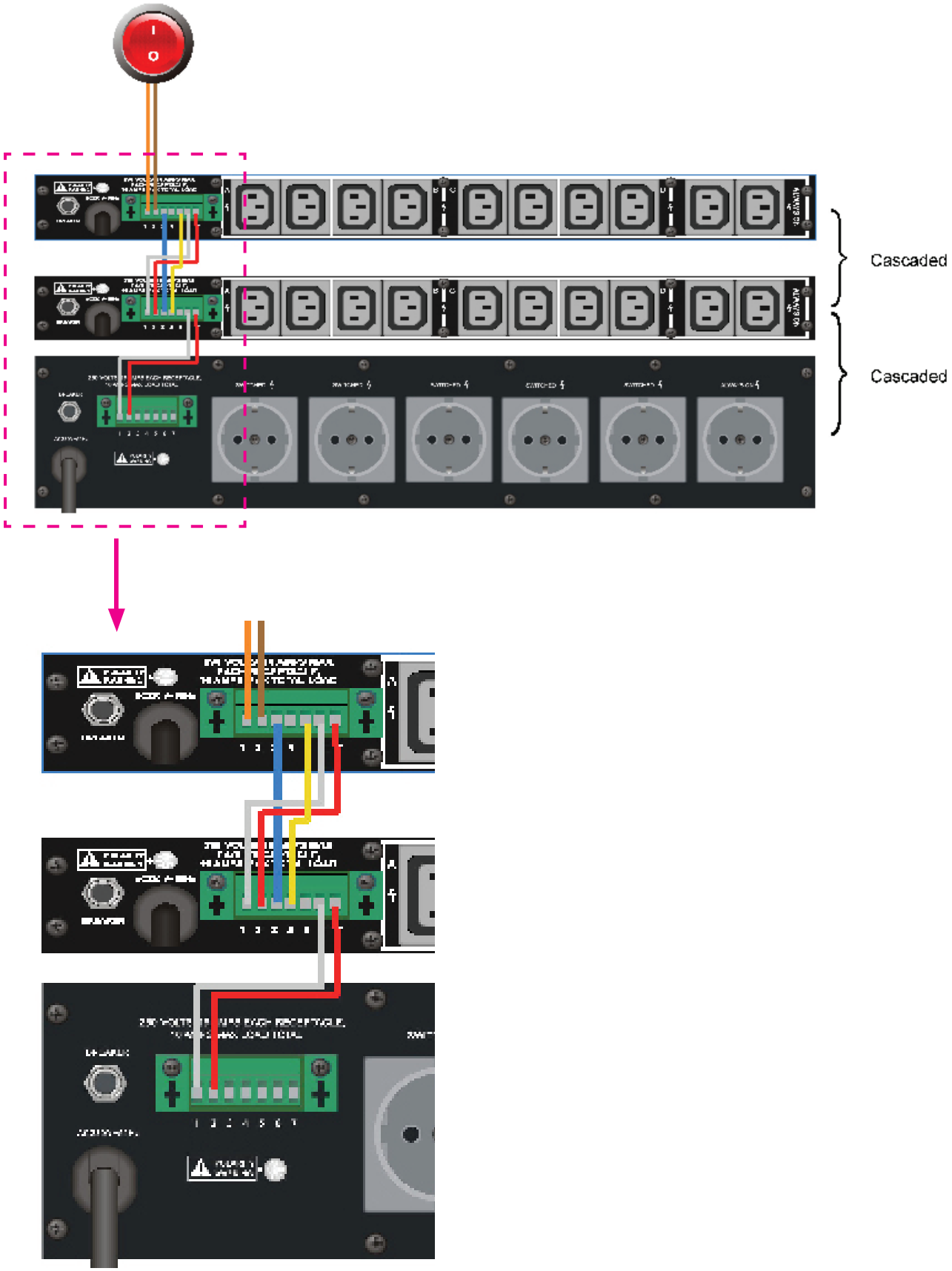
Wiring Diagrams



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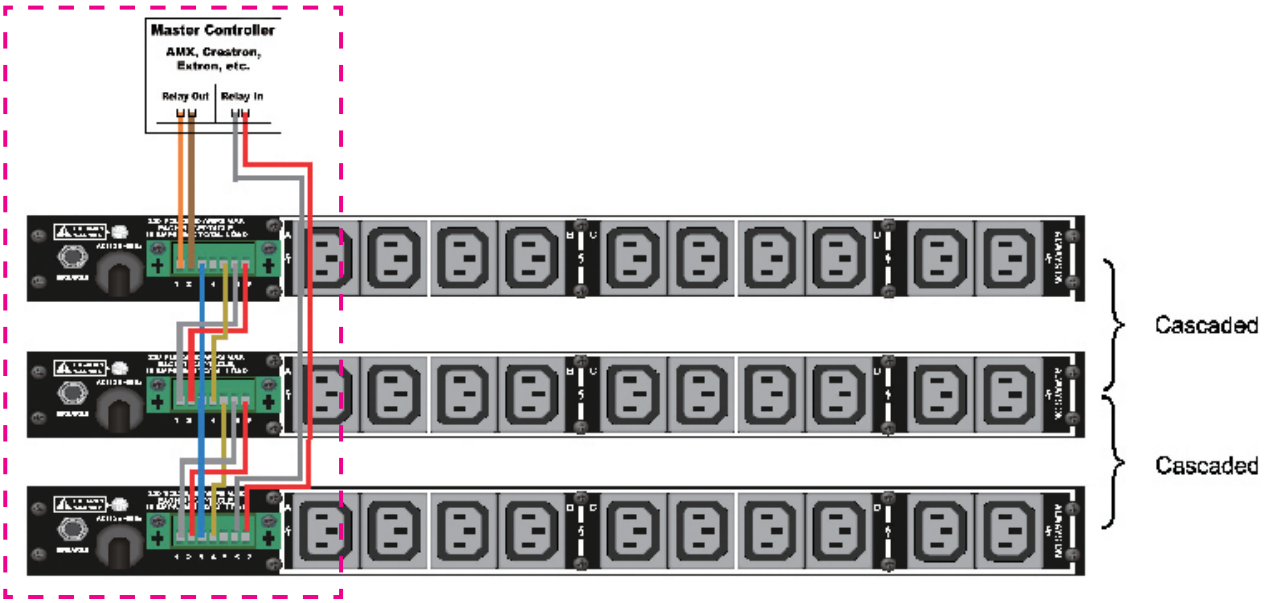
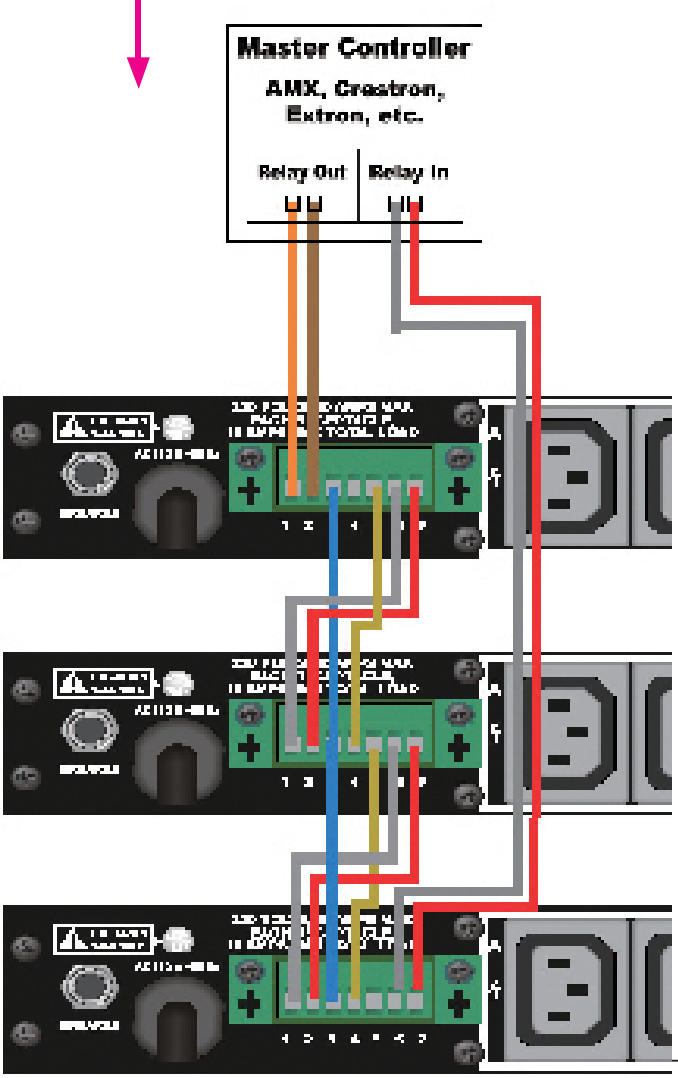
Wiring Diagrams





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Sequence Control Input

The sequencer can be controlled by either a contact closure or a DC voltage from 5V to 30V. A contact closure can be a relay contact or a latching switch. A latching switch is one that stays in either the on or the off position (like a light switch). To use a relay contact or latching switch connect the contacts to pins 1 & 2. To use a DC voltage connect the negative wire to pin 3 and the positive wire to pin 2. If the unit is going to be operated only by the front panel switch without a remote control input then place a short jumper wire between pins 1 & 2. Switches with gold contacts are recommended for the best long-term reliability.

External LED Connections

The 12V LED output (pin 4) is able to power an external LED and will provide 10mA of current. An external LED connected to this output will indicate when the sequencer is powered up. It is not necessary to use a series resistor unless the LED is too bright. If this is the case you can try a 1K resistor or a 2.2K resistor in series with one of the LED leads. Connect the LED anode to the 12V LED Output and the cathode to Common.

Confirmation Feedback

The sequencer offers two ways to provide confirmation feedback to a central controller: isolated relay contacts or the 12V LED output. Confirmation tells the controller that the unit has indeed powered up or that it is fully powered down. If the auxiliary relay contacts and 12V LED output are not used for any other function, you will be free to choose whichever provides the best interface for the application. However, if one of these outputs is used for another function you will have to use the one that is available.

To use the 12V LED output for confirmation, connect the 12V LED Output pin to the positive input of the controller and the Common pin to equipment earth. The output will be at 12V when the unit is powered up and will be at zero volts when all banks are powered down. Note that the common terminal is shared between the inputs and the 12V LED output, and that the 12V LED output is limited to 10mA.

Operation

The sequencer can be used in one of three configurations: as a stand-alone four-bank sequencer; with another remote-controllable SurgeX product as a combination five-bank sequencer or connected with other sequencers as a cascaded system of two or more units.

First, make all basic connections as explained above. Then, if the system includes more than one unit, make the additional control connections between units as per the application diagrams. Finally, select the delay time by inserting a small screwdriver in the hole in the front panel. The available delay times are: 2s, 5s, 10s, 15s and 20s. The delay time must be selected on every unit when multiple units are cascaded together.

When all banks are off the bank status LED's are red. If the sequencer is to be powered up only by using the front panel power switch then bridge pins 1 & 2 on the remote control connector with a jumper. If a remote control input is to be used to power up the sequencer then leave the power switch on. The power switch must be on to initiate the power-up sequence whether a remote control input is used or not. If the power switch is not being used it can be turned on and then covered using the supplied switch cover. When multiple units are cascaded all the slave units should have their power switches turned on and covered.

When the power switch is on and the remote control input is activated the unit will begin the power up sequence. The remote control input is activated by either a contact closing (pins 1 & 2) or a voltage of 5-30V being applied (pins 2 & 3). Bank A will always turn on first, then banks B, C & D. As each bank switches on, the front panel bank status LED's change from red to green. The flashing yellow LED's indicate the power up sequence is running. Finally, after bank D is powered up the auxiliary relay activates after the set delay time. The auxiliary relay contacts are connected to the remote control connector pins 6 & 7 and can be used to control another unit or provide feedback to a central controller.

When either the power switch is turned off or the remote control input is deactivated the unit will begin the power down sequence, this is the reverse of the power up sequence. The auxiliary relay will turn off first, then banks D, C, B & A. As each bank switches off, the bank status LED's change from green to red. The flashing yellow LED's indicate the SEQ1200i is waiting for the delay time to elapse before moving to the next bank. When multiple units are cascaded together the last unit in the chain powers down first.

Other Status LED's

Red Power LED: Shows that the mains is connected and the power switch is on.

Green Self Test LED: Illuminates to indicate that the surge elimination circuitry is fully operational.

Orange Over/Under-Voltage Shutdown LED: Illuminates if the mains voltage rises above 280 volts or falls below 180 volts. When this LED is illuminated all receptacles are turned off.

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Characteristics

Protection type	SurgeX® *Advanced Series Mode*®
Nominal line to neutral voltage U0 (V)	230V
Max.Cont. Operating Voltage Uc (V)	260VAC
Voltage protective level Up (V)	1KV
Max. shorted current. (Isc)	3KA
Open circuit voltage (Uoc)	6KV
TOV characteristic (UT)	TOV withstand, t_T = 5s, U_T = 335V;
Degree of protection (IP)	IP20
Disconnection Device	Plug
Applicable Power Supply System	TN TT IT
Polarity indicator (near the supply cord)	Illuminated: Incorrect; Off: correct
Location	Indoor
Number of ports	Two
Voltage regulation	≤ 1%
Operation temperature and humidity:	-40 - +35°C, 30-90%
Importer: XXXX; Address:XXXX.	

Made in China

Limited Ten Year Product Warranty

AS3112, BS1363, BS546, and CEE7/7 International Products

For a period of 10 years from the date of your purchase of any SurgeX international product, SurgeX warrants the product (AS3112, BS1363, BS546, CEE7/7 standard) against defects in materials used by SurgeX or workmanship performed by SurgeX (a "Covered Product"). SurgeX's obligations with respect to a Covered Product are to provide, at no charge, all labor and parts (either new or rebuilt, as determined in SurgeX's sole discretion) necessary for the repair of the Covered Product. If SurgeX, in its sole discretion, determines that a Covered Product is not repairable, SurgeX will replace the Covered Product with a product of like kind, quality and functionality. In order to obtain the services under this Limited Warranty, you are responsible for delivering the Covered Product, at your sole cost, to a SurgeX authorized distributor, and for providing the SurgeX authorized distributor with a copy of the dealer's dated bill of sale as evidence of the date of purchase of the product.

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